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REMARKS

Claims 9-12 and 14 are presently pending in this application. Applicant notes that in view of the Appeal Brief filed on June 1, 2004, prosecution has been reopened.

In the latest Office Action, the Examiner rejected claims 9-12 under 35 USC §103 as being unpatentable over Burns et al (Principles of Electronic Circuits) in view of "applicant's admitted prior art" with Henley et al. The Examiner maintains that it would have been obvious to implant hydrogen ions into the silicon dioxide layer of Burns et al. as taught by "Applicant's admitted prior art" using the PSII technique of Henley et al. Applicant previously pointed out that there is no motivation to combine the teachings of the references as Henley et al. do not teach or suggest treating the surface of a silicon dioxide substrate for the purpose of providing a subsequent layer of polycrystalline silicon having a smooth morphology. In his remarks, the Examiner pointed out that applicant's claims do not recite that the hydrogen ions are implanted on the surface of a layer of silicon dioxide. With this amendment, claims 9-12 and 14 have been amended to recite that the surface of the layer of silicon dioxide has been doped with hydrogen ions. Basis for this amendment may be found in the specification at page 3, lines 9-10 and 22-23, page 6, lines 7-8, and page 11, lines 14-16.

The claims, as amended, are believed to further distinguish over Henley et al., who teach implanting ions beneath the surface of the silicon wafer but above the surface of the insulating layer. The teachings of Henley et al. provide no motivation for implanting hydrogen ions on the surface of a silicon dioxide layer for the purpose of providing a smooth morphology for a layer of polycrystalline silicon formed on the silicon dioxide layer as taught in the present invention. Rather, Henley et al. teach an ion immersion technique. There is no teaching or suggestion in Henley et al. that their method would be applicable to the surface of a silicon dioxide layer and would successfully result in a layer of silicon dioxide which is free of metal contaminants as claimed.

While the Examiner maintains that Henley et al. has only been relied on for the teaching of implanting hydrogen into semiconductor articles by a PSII method and that "applicant's admitted prior art" teaches a surface treatment, applicant wishes to reiterate that Henley et al. do not teach or suggest the specific use of hydrogen plasma ions as

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claimed but rather teach a variety of ions, gases, and carbon. While the Examiner has maintained that this limitation is also taught by "applicant's admitted prior art," the combined reference teachings still provide no motivation for one skilled in the art to implant hydrogen ions on the surface of a silicon dioxide layer which is free of metal contaminants and to provide a smooth morphology for a subsequently deposited polycrystalline silicon layer as claimed. One skilled in the art would not look to Henley et al. to correct the deficiencies of "applicant's admitted prior art," i.e., metal contamination, when Henley et al. do not teach a surface treatment and do not teach the specific use of hydrogen ions. The Examiner asserts that he is relying on the teaching of the references as a whole to provide proper motivation, but instead appears to rely only on bits and pieces of each reference teaching using hindsight reconstruction in order to meet applicant's claims. There is nothing in the references which would lead one skilled in the art to combine their teachings as proposed by the Examiner. Claims 9-12 and 14, as amended, are clearly patentable over the cited references.

Claim 14 stands rejected under 35 USC §103 as being unpatentable over Murata et al. (U.S. Patent No. 5,576,229) in view of "Applicant's admitted prior art" with Henley et al. The Examiner has admitted that Murata et al. do not teach a substrate which is free of metal contaminants as claimed, but maintains that it would have been obvious to implant hydrogen ions into the glass substrate of Murata et al. based on the teachings of "applicant's admitted prior art" and Henley et al. For the same reasons discussed above, there is clearly no motivation to combine the teachings of the references. Henley et al. do not teach or suggest implanting hydrogen ions onto the surface of a semiconductor substrate as recited in amended claim 14. The Examiner cannot choose to ignore the fact that Henley et al. do not teach a surface treatment as claimed.

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For all of the reasons stated above, applicant submits that claims 9-12 and 14, as amended, are patentable over the prior art of record. Early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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